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(54) **REFRIGERATOR**

(71) Applicant: **LG Electronics Inc.**, Seoul (KR)
(72) Inventors: **Jaeyoung Kim**, Seoul (KR); **Seonil Yu**, Seoul (KR)
(73) Assignee: **LG Electronics Inc.**, Seoul (KR)
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(56) **References Cited**

U.S. PATENT DOCUMENTS

8,801,124 B2* 8/2014 Jung F25D 23/025
312/405
2015/0069900 A1* 3/2015 Lim F25D 23/028
312/405

(Continued)

FOREIGN PATENT DOCUMENTS

KR 10-0165019 1/1999
KR 10-2015-0074233 7/2015

(Continued)

OTHER PUBLICATIONS

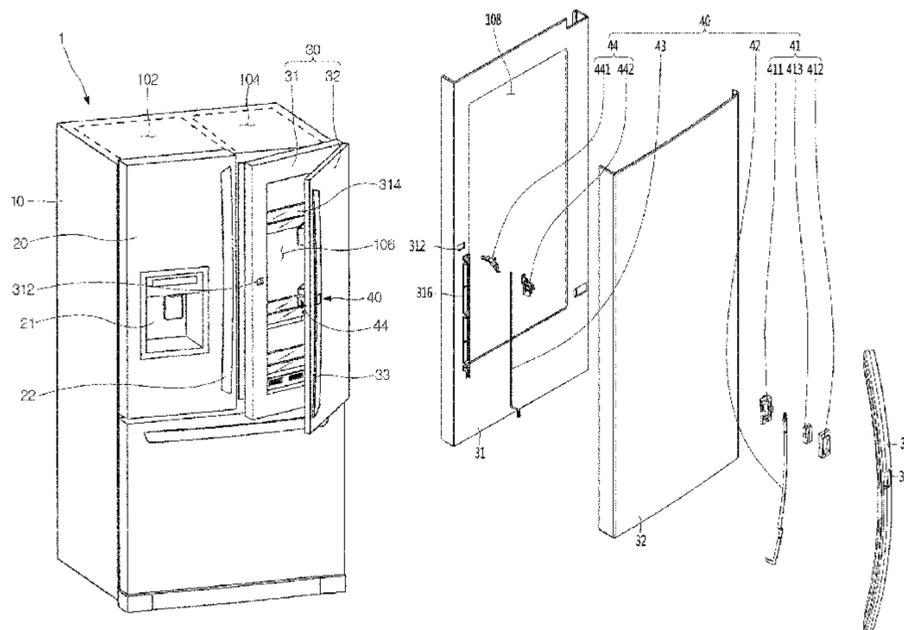
Translation of International Search Report and Written Opinion in International Application No. PCT/KR2017/004564, dated Jul. 28, 2017, 10 pages.

Primary Examiner — James O Hansen
(74) *Attorney, Agent, or Firm* — Fish & Richardson P.C.

(57) **ABSTRACT**

A refrigerator according to an embodiment of the present invention comprises an opening unit configured such that, when a second door rotates in order to open a second storing chamber, the second door is separated from a first door. The opening unit comprises: a latch hook provided on the second door so as to be selectively inserted into a latch slot formed on the front surface of the first door; a pressing portion provided on a door handle provided on the front surface of the second door, the pressing portion comprising a guide protrusion having a sloping surface formed on one side thereof; and a link portion having a contact portion formed on one end thereof so as to contact the sloping surface and to move upward/downward along the sloping surface, the other end of the link portion contacting the latch hook. When the pressing portion is pressed, the contact portion moves upward along the sloping surface, and the other end of the

(Continued)



link portion pushes the latch hook upward together with the contact portion such that the latch hook is separated from the latch slot.

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E05C 19/12 (2006.01)
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(56) **References Cited**

U.S. PATENT DOCUMENTS

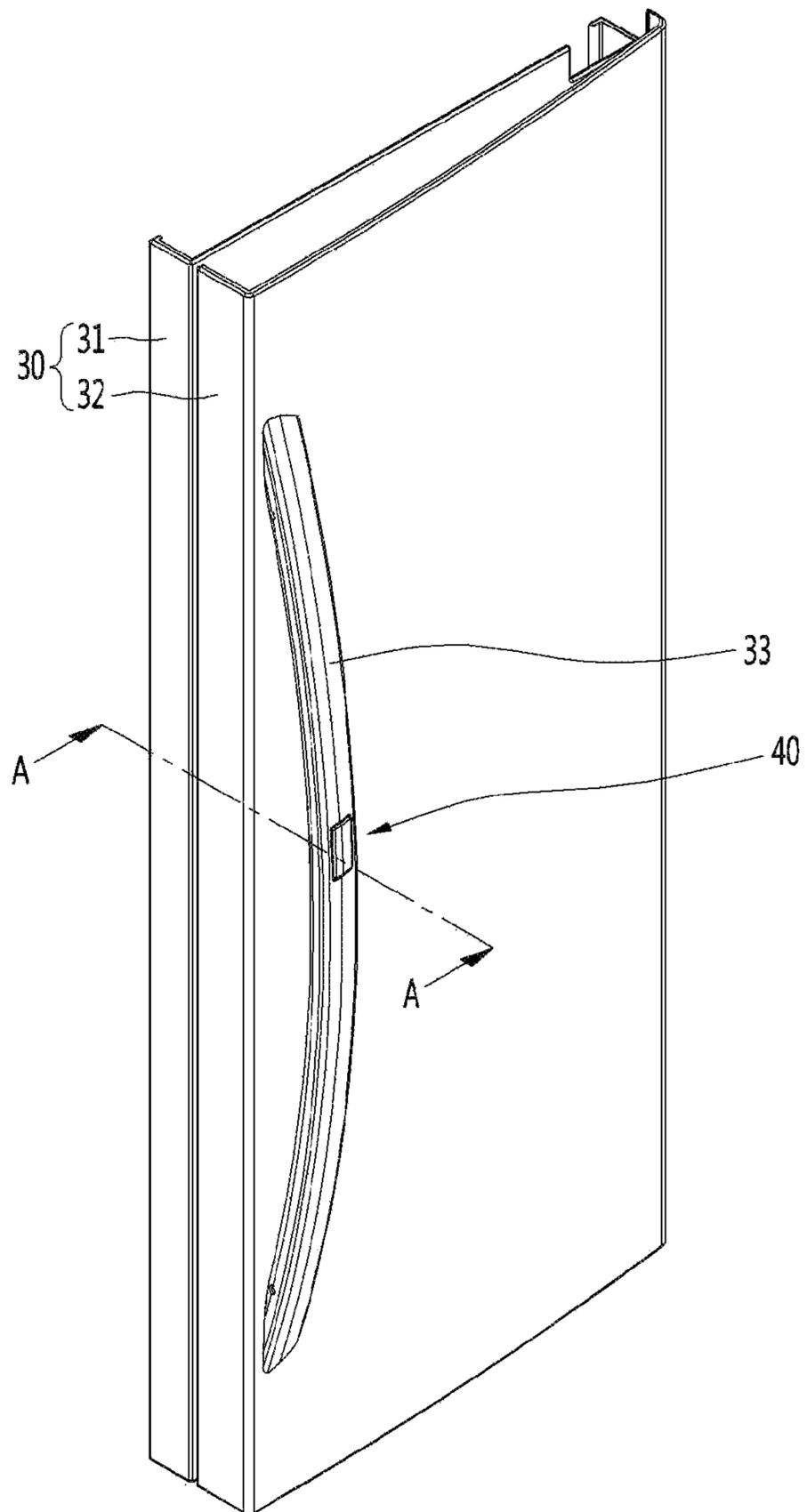
2015/0260443	A1*	9/2015	Lee	F25D 23/02
					312/404
2016/0201976	A1*	7/2016	Choi	E05B 62/0042
					312/405

FOREIGN PATENT DOCUMENTS

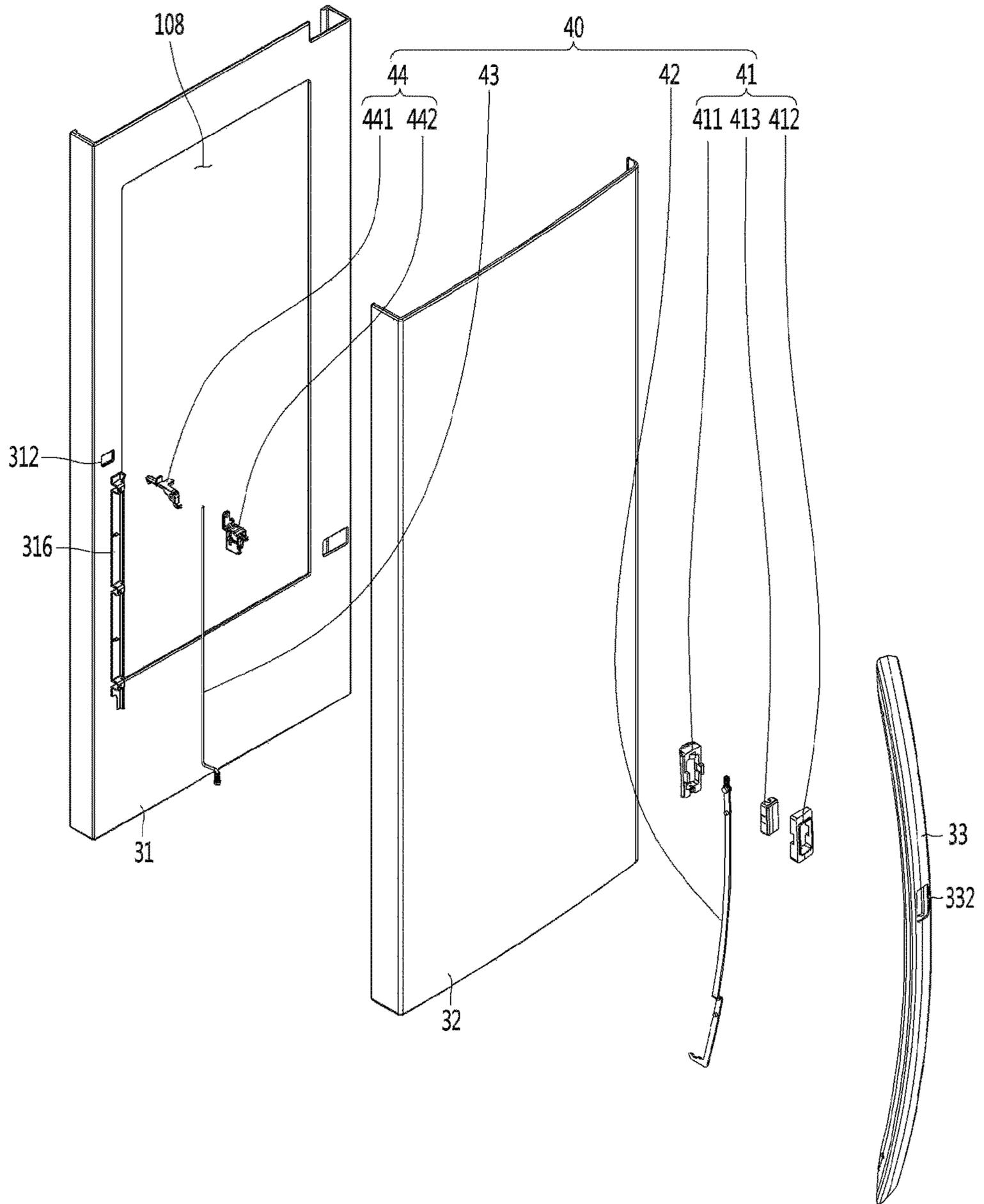
KR	10-2015-0099024	8/2015
KR	10-2015-0106311	9/2015
KR	10-1575929	12/2015

* cited by examiner

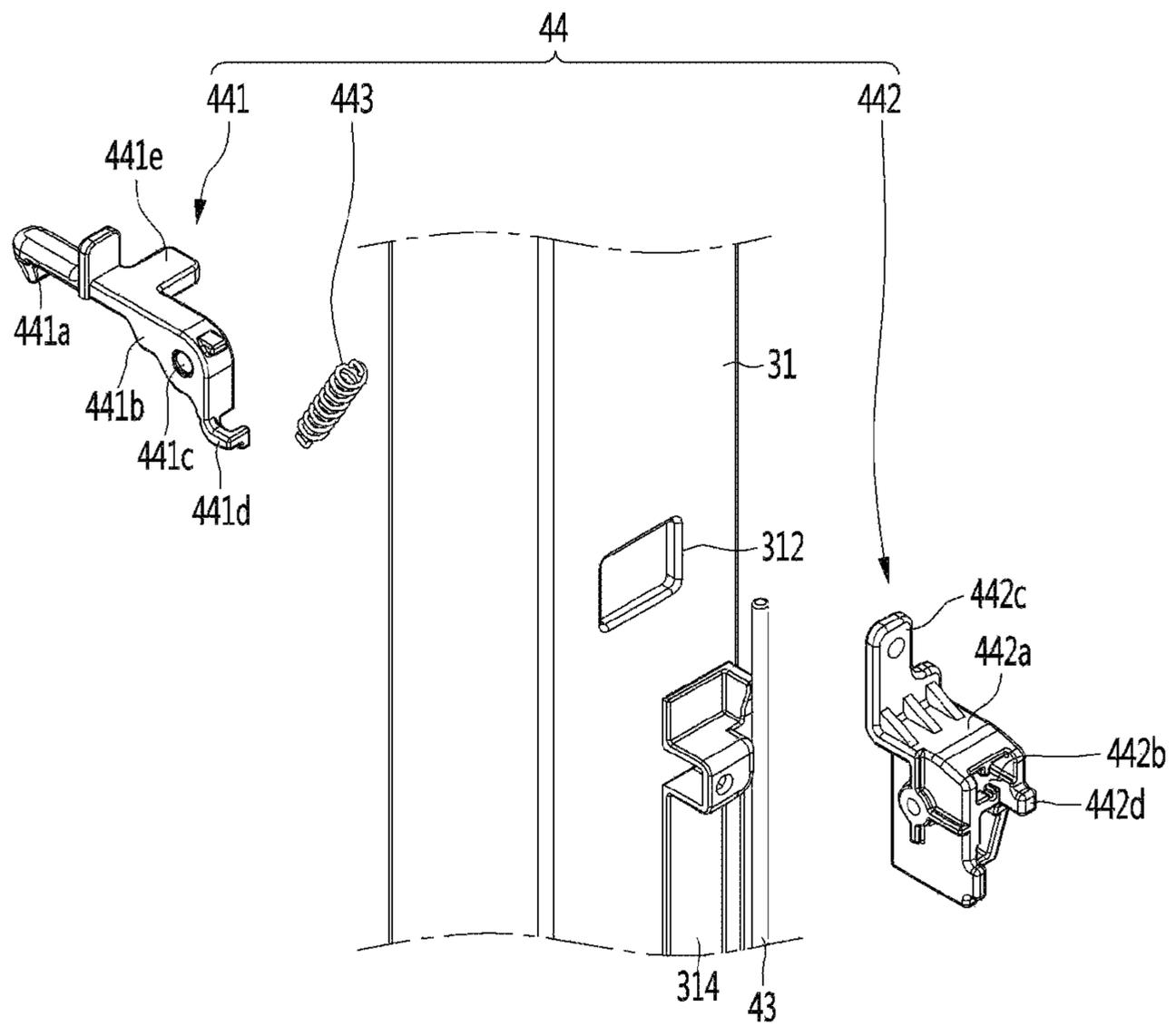
【FIG. 2】



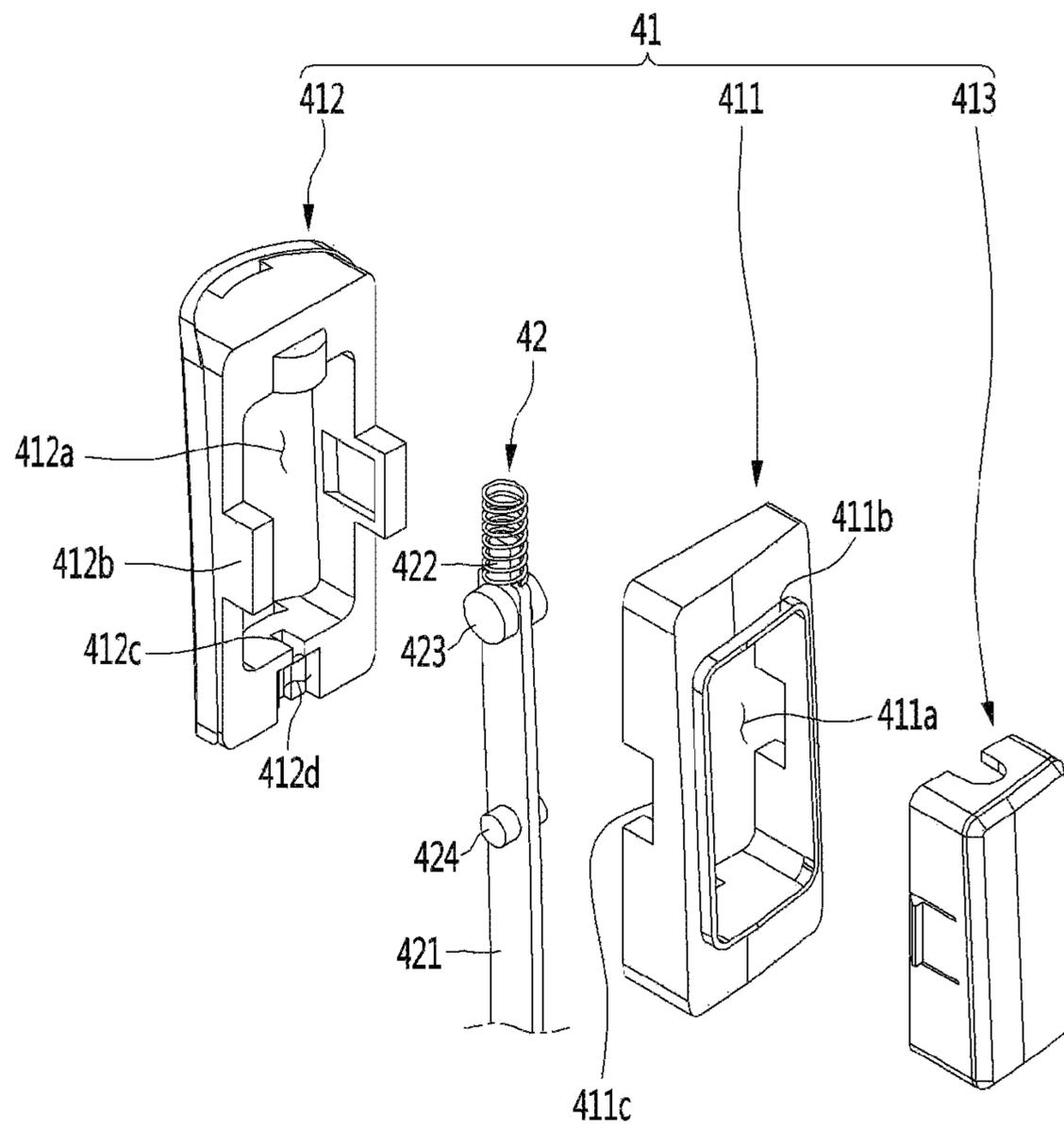
【FIG. 3】



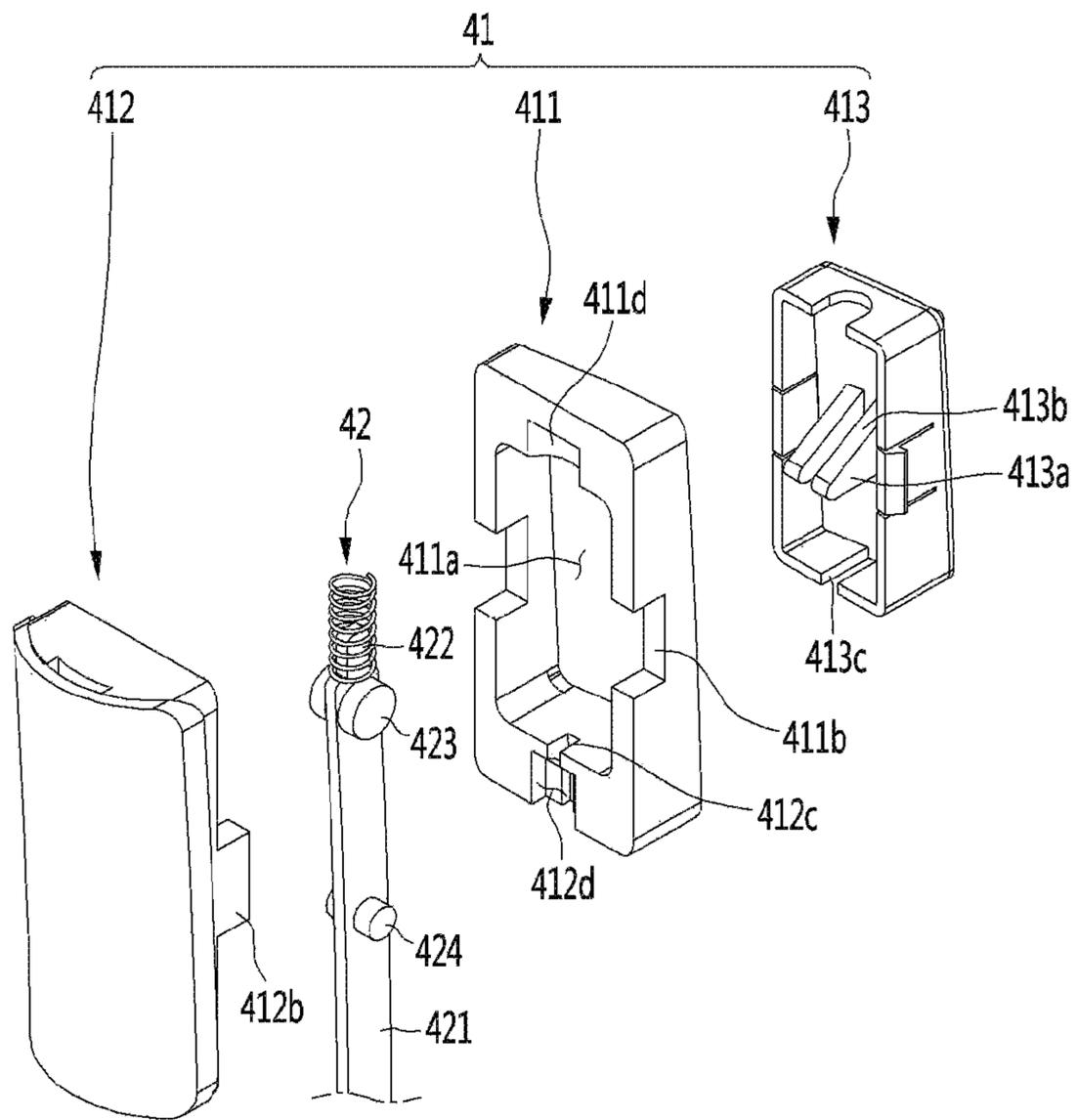
【FIG. 4】



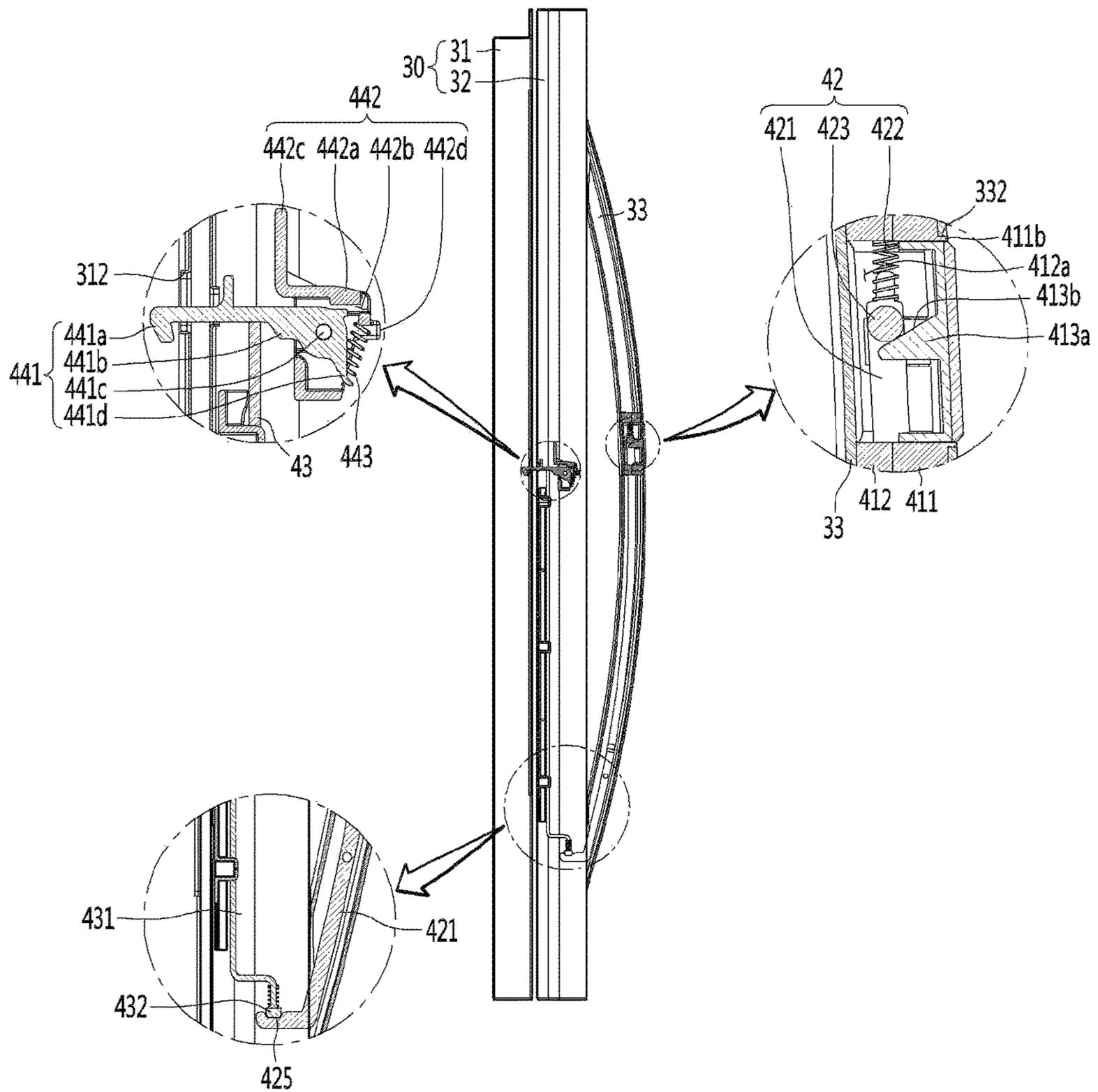
【FIG. 5】



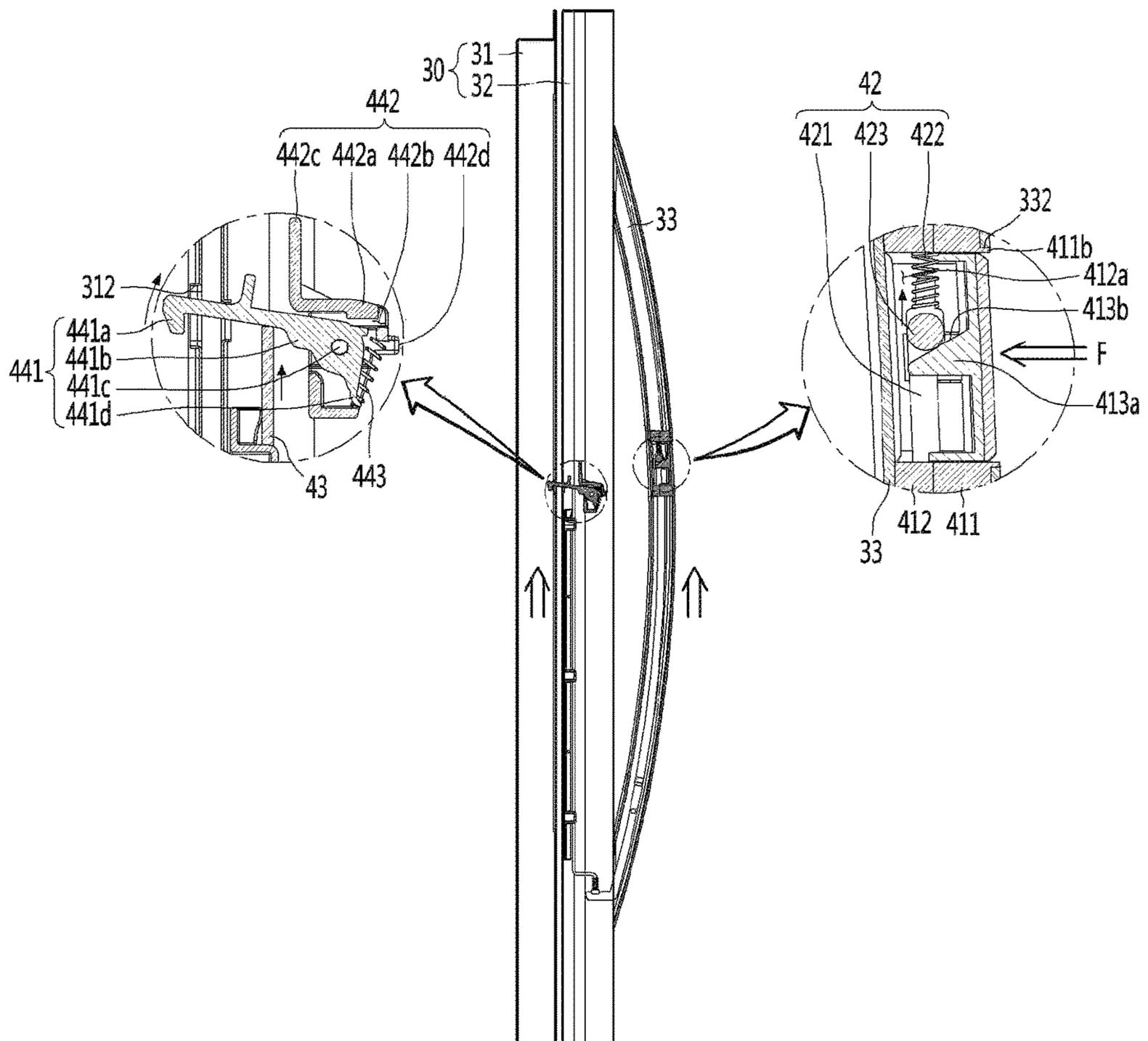
【FIG. 6】



【FIG. 7】



【FIG. 8】



1**REFRIGERATOR**CROSS-REFERENCE TO RELATED
APPLICATIONS

This application is a National Stage application under 35 U.S.C. § 371 of International Application No. PCT/KR2017/004564, filed on Apr. 28, 2017, which claims the benefit of Korean Application No. 10-2016-0053885, filed on May 2, 2016. The disclosures of the prior applications are incorporated by reference in their entirety.

TECHNICAL FIELD

The present invention relates to a refrigerator.

BACKGROUND ART

A refrigerator is a household appliance used to store food in a refrigerated state or a frozen state.

The refrigerator includes a main body, in which a storage compartment is formed, and a door movably connected to the main body to open or close the storage compartment.

The storage compartment may be divided into a refrigerating compartment and a freezing compartment, and the door includes a refrigerating compartment door for opening or closing the refrigerating compartment and a freezing compartment door for opening or closing the freezing compartment.

A user opens the freezing compartment door or the refrigerating compartment in order to take out food stored in the freezing compartment or the refrigerating compartment. When the door of the refrigerator is opened, the user pulls the door of the refrigerator open by strong force due to internal pressure of the refrigerator. Therefore, the user needs to grasp and pull the handle of the door by force.

In order to overcome such a disadvantage, Korean Laid-Open Publication No. 10-2013-0053318 discloses a refrigerator door having a latch open structure mounted in the handle of the door.

In the prior art, a second door is rotatably mounted on a front end of a first door for opening or closing a storage compartment of a refrigerator. In order to open the second door, a pressing button formed on the handle of the second door is pressed. When the pressing button is pressed, a pressing pin connected to the pressing button presses a latch member formed on the first door, thereby unlocking the second door.

However, the refrigerator of the prior art has the following problems.

First, in order to unlock the latch member, since a connector having the pressing pin accommodated therein and connecting the second door with the handle is formed, the appearance of the refrigerator is not clean due to the connector.

Second, when the user grasps the handle to open the door, since the hand grasping the handle interferes with the connector formed on the handle, it is inconvenient to open the door.

DISCLOSURE

Technical Problem

An object of the present invention devised to solve the problem lies in a refrigerator capable of improving the appearance of the refrigerator, eliminating interference with

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a latch upon opening a door, and separating a first door and a second door from each other by simple operation.

Technical Solution

The object of the present invention can be achieved by providing a refrigerator including a cabinet in which a first storage compartment is formed, a first door rotatably connected to a front surface of the cabinet to selectively open or close the first storage compartment and including a latch slot formed in an edge of one side thereof, a storage device formed on a rear surface of the first door to form a second storage compartment, a second door rotatably connected to a front surface of the first door to selectively open or close the second storage compartment, a door handle formed on a front surface of the second door, and an opening unit configured to separate the second door from the first door when the second door rotates in order to open the second storage compartment.

In particular, the opening unit includes a latch hook provided on the second door to be selectively inserted into the latch slot, a pressing portion provided on the door handle and including a guide protrusion having an inclined surface formed on one side thereof, and a link portion having a contact portion formed on one end thereof to contact the inclined surface and to move upward and downward along the inclined surface, the other end of the link portion contacting the latch hook. When the pressing portion is pressed, the contact portion moves upward along the inclined surface, and the other end of the link portion pushes the latch hook upward together with the contact portion, such that the latch hook is separated from the latch slot.

Advantageous Effects

The refrigerator according to the embodiments of the present invention having the above configuration has the following effects.

First, since a latch structure for opening a door is not exposed to the outside, the appearance of the refrigerator is improved.

Second, when a user grasps a handle to open the door, interference with the latch structure does not occur.

Third, in a double door structure, it is possible to separate a first door and a second door from each other by only grasping the handle of the door, thereby improving user convenience.

DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of a refrigerator according to an embodiment of the present invention.

FIG. 2 is a perspective view of a refrigerating compartment door according to an embodiment of the present invention.

FIG. 3 is an exploded perspective view of the refrigerating compartment door.

FIG. 4 is an exploded perspective view of a latch hook according to an embodiment of the present invention.

FIG. 5 is an exploded perspective view of a pressing portion according to an embodiment of the present invention.

FIG. 6 is a view of the pressing portion of FIG. 5 when viewed in another direction.

FIG. 7 is a longitudinal cross-sectional view taken along line A-A of FIG. 2.

FIG. 8 is a view showing the state of the pressing portion and the latch hook when the pressing portion operates according to the embodiment of the present invention.

BEST MODE

Hereinafter, a refrigerator according to an embodiment of the present invention will be described in detail with reference to the drawings.

FIG. 1 is a perspective view of a refrigerator according to an embodiment of the present invention.

Referring to FIG. 1, the refrigerator 1 according to the embodiment of the present invention includes a cabinet 10, in which a storage compartment is formed, and doors 20 and 30 for opening or closing the storage compartment.

The storage compartment includes a freezing compartment 102 and a refrigerating compartment 104. The freezing compartment 102 and the refrigerating compartment 104 may be disposed side to side and may be partitioned by a partition.

The doors 20 and 30 may include the freezing compartment door 20 for opening or closing the freezing compartment 102 and the refrigerating compartment door 30 for opening or closing the refrigerating compartment 104.

The freezing compartment door 20 and the refrigerating compartment door 30 may be rotatably mounted on the front surface of the cabinet 10.

In addition, a sliding door slidably mounted on the front surface of the cabinet 10 may be formed below the freezing compartment door 20 and the refrigerating compartment door 30, in order to open or close a separate storage compartment.

A dispenser 21 for dispensing water or ice may be provided in the front surface of the freezing compartment door 20, and a freezing compartment door handle 22 grasped by a user to open the freezing compartment door 20 may be provided on one side of the front surface of the freezing compartment door 20.

The refrigerating compartment door 30 includes a first door 31 rotatably mounted on the front surface of the cabinet 10 and a second door 32 rotatably mounted on the front surface of the first door 31, in order to open or close the refrigerating compartment 104.

Specifically, a storage device for storing food is provided on the rear surface of the first door 31. The storage device includes a frame 314 forming a storage space. The frame 314 is detachably coupled to the rear surface of the first door 31.

In a state in which the first door 31 closes the refrigerating compartment 104, the frame 314 is located in the refrigerating compartment 104. In the present embodiment, the refrigerating compartment 104 may be referred to as a first storage compartment and a space formed by the frame 314 may be referred to as a second storage compartment 106. Hereinafter, assume that the refrigerating compartment 104 is the first storage compartment 104.

Accordingly, in a state in which the first door 31 closes the first storage compartment 104, the second storage compartment 106 is located in the first storage compartment 104.

The first door 31 is rotatably connected to the cabinet 10 by a hinge assembly.

The hinge assembly may include a second hinge (not shown) connecting the first door 31 with the second door 32 and a first hinge (not shown) connecting the first door 31 with the cabinet 10.

An opening (108 of FIG. 3), which allows the food stored in the second storage compartment 106 to be put into or taken out in a state in which the first door 31 closes the first

storage compartment 104, is formed in the first door 31. Accordingly, the opening 108 may be opened in a state in which the first door 31 closes the first storage compartment 104 to allow food to be put into or taken out from the second storage compartment 106.

A refrigerating compartment door handle 33 grasped by the user may be provided on one side of the front surface of the second door 32, in order to open the second door 32.

In addition, a latch hook 44 for coupling with the first door 31 is formed on the rear surface of the second door 32, and a latch slot 312, to which the latch hook 44 is coupled, is formed in the front surface of the first door 31.

The latch hook 44 may be selectively coupled to the latch slot 312. Accordingly, when the latch hook 44 is coupled to the latch slot 312, the first door 31 and the second door 32 rotate as one body by rotation of the second door 32, and, when the latch hook 44 is separated from the latch slot 312, the second door 32 independently rotates.

In the present embodiment, an opening unit 40 corresponding to a means for separating the latch hook 44 from the latch slot 312 is provided on one side of the refrigerating compartment door handle 33.

The opening unit 40 may move forward and backward by operation of the user to separate the latch hook 44 from the latch slot 312, and may be exposed through the front surface of the second door 32. Accordingly, when the opening unit 40 operates through the refrigerating compartment door handle 33, the latch hook 44 may be separated from the latch slot 312 to open the second door 32.

Hereinafter, the configuration of the opening unit will be described in detail with reference to the drawings.

FIG. 2 is a perspective view of the refrigerating compartment door according to the embodiment of the present invention, FIG. 3 is an exploded perspective view of the refrigerating compartment door, FIG. 4 is an exploded perspective view of the latch hook according to the embodiment of the present invention, FIG. 5 is an exploded perspective view of a pressing portion according to an embodiment of the present invention, and FIG. 6 is a view of the pressing portion of FIG. 5 when viewed in another direction.

Referring to FIGS. 2 to 6, the refrigerating compartment door 30 includes the first door 31 having the opening 108 formed in the front surface thereof and the second door 32 rotatably mounted on the front surface of the first door 31 to open or close the opening 108 of the first door 31.

The latch slot 312, into which the latch hook 44 is selectively fitted, is formed at one side of the opening 108 of the first door 31.

The refrigerating compartment door handle 33 for rotating the second door 32 is provided on the front surface of the second door 32, and the opening unit 40 for separating the latch hook 44 from the latch slot 312 is mounted at one side of the refrigerating compartment door handle 33.

Specifically, the refrigerating compartment door handle 33 is formed in a hollow shape, the opening unit 40 may be accommodated in the hollow space of the refrigerating compartment door handle 33. The opening unit 40 may be mounted in a mounting groove 332 formed by cutting a portion of the front surface of the refrigerating compartment door handle 33.

The opening unit 40 may include a pressing portion 41 pressed by the user, a first link 42 movable upward by operation of the pressing portion 41, a second link 43 moving upward according to upward movement of the first link 42, and the latch hook 44 separated from the latch slot

312 by upward movement of the second link 43. The first link 42 and the second link 43 may be defined as a link portion.

The latch hook 44 is fixed to the rear surface of the second door 32 and a portion thereof is hooked on the latch slot 312 of the first door 31.

Specifically, the latch hook 44 includes a hook guide 442 fixed to the rear surface of the second door 32 and a hook portion 441 hinged to the hook guide 442.

The hook guide 442 includes a body 442a forming a mounting space in which the hook portion 441 is rotatably mounted. The body 442a has a screw fastening portion 442c at an upper end thereof to be fixed to the rear surface of the second door 32 by a screw. In addition, a first spring coupling portion 442d is formed on the front end of the body 442a. The first spring coupling portion 442d is a portion, to which a torsion spring 443 connecting the hook portion 441 with the body 442a is coupled.

The hook portion 441 is mounted in the mounting space 442b formed by the hook guide 442 to be rotatable by a predetermined angle.

The hook portion 441 includes a hook member 441 inserted into and hooked on the latch slot 312. The end of the hook member 441a is hooked on the rear surface of the first door 31 after passing through the latch slot 312.

The hook portion 441 further includes a hinge portion 441b extending from the hook member 441a in a front end direction. A hinge shaft 441c is formed in the hinge portion 441b, such that the hook portion 441 rotates when the hook portion 441 is mounted in the mounting space 442b of the hook guide 442.

A second spring coupling portion 441d is formed on the lower side of the front end of the hinge portion 441b. The torsion spring 443 connecting the hook guide 442 with the hook portion 441 is coupled to the second spring coupling portion 441d. That is, one end of the torsion spring 443 may be fixed to the first spring coupling portion 442d and the other end thereof may be coupled to the second spring coupling portion 441d.

By this structure, the hook portion 441 may be pressed downward by the torsion spring 443. Accordingly, in a state in which external force is not applied to the hook portion 441, the hook portion 441 may be inserted into and hooked on the latch slot 312.

Meanwhile, an extension 441e extending laterally may be formed on the hinge portion 441b. The extension 441e is pressed by the upper end of the second link 43 by moving the first link 42 and the second link 43 upward by operation of the pressing portion 41. The lower surface of the extension 441e may be in contact with the upper end of the second link 43.

The second link 43 is located below the extension 441e. The upper end of the second link 43 may be in contact with the lower end of the extension 441e, and a portion of the second link 43 may be supported by a support portion 341 formed on the front surface of the first door 31.

The support portion 314 is formed on the front surface of the first door 31 to be elongated in a vertical direction and may be in contact with a portion of the second link 43. Accordingly, when the second link 43 moves upward and downward as the first link 42 moves upward and downward, the second link 43 may move without shaking.

Although not shown, a support portion supporting upward and downward movement of the first link 42 may be formed on the first link 42. In this case, the support portion supporting the first link 42 may be provided inside the refrigerating compartment door handle 33.

Meanwhile, the pressing portion 41 is operated by the user in order to separate the latch hook 44 from the latch slot 312 to open the second door 32.

Specifically, the pressing portion 41 may include a first cover 411 mounted in the mounting groove 332, a second cover 412 coupled to the first cover 411 to form an accommodation space 412a, and a pressing member 413 mounted in the accommodation space 412a to move forward and backward. The first cover 411 and the second cover 412 may be defined as a pressing portion guide.

An opening 411a is formed in the first cover 411, and a protrusion 411b to be inserted into and coupled to the mounting groove 332 is formed on the edge of the opening 411a. Accordingly, the protrusion 411b may be inserted into the mounting groove 332, such that the first cover 411 is mounted in the refrigerating compartment door handle 33.

The first cover 411 may be coupled to the second cover 412 in concave and convex shapes. Fitting grooves 411c for coupling with the second cover 412 may be formed at both sides of the first cover 411 and fitting protrusions 412b fitted into the fitting grooves 411c may be formed in both sides of the second cover 411. Accordingly, the first cover 411 and the second cover 412 are coupled to each other to form the accommodation space 412a in which the pressing member 413 and the first link 42 are accommodated.

The second cover 412 is coupled with the first cover 411 to form the accommodation space 412a. In addition, the fitting protrusions 412b are formed on both sides of the second cover 412.

A slider mounting portion formed by coupling the second cover 412 with the first cover 411 is provided on the inner bottom surface of the second cover 412. The slider mounting portion may be formed in a shape corresponding to the first cover 411 and the second cover 412.

The slider mounting portion may include a slider slit 412c, into which the below-described first slider 412 is fitted, and a stopper groove 412d in which the below-described stopper protrusion 424 is accommodated.

The slider slit 412c and the stopper groove 412d may be formed in the rear surface of the lower end of the first cover 411 and the front surface of the lower end of the second cover 412, respectively. The slide slit 412c and the stopper groove 412d communicate with each other and may be formed by coupling between the first cover 411 and the second cover 412.

Meanwhile, the front surface of the pressing member 413 is pressed by the user to press the first link 42 accommodated in the accommodation space 412a. The front surface of the pressing member 413 may be exposed to the outside such that the pressing member 413 is easily pressed by the user. The pressing 413 may shield the first link 42 and the opening 411a of the first cover 411.

Specifically, the pressing member 413 is formed in a box form to open the rear surface thereof. The pressing member 413 may be mounted in the accommodation space 412a through the opening 411a, and a first elastic member (not shown) may be interposed between the inside of the pressing member 413 and the inside of the second cover 412. Accordingly, the pressing member 413 may be mounted to move forward and backward by the first elastic member.

Guide protrusions 413a protruding toward the first link 42 are formed on the rear surface of the pressing member 413. The guide protrusions 413a may form a pair.

Specifically, the guide protrusions 413a may include a first guide protrusion 413a and a second guide protrusion 413a formed at a point laterally spaced apart from the first guide protrusion, and each guide protrusion 413a includes

an inclined surface **413b**. The guide protrusions **413a** may be formed to be inclined downward from the rear surface of the pressing member **413** to the first link **42**.

The first link **42** may be movably fitted between the pair of guide protrusions **413a**. At this time, a portion **413c** of the lower surface of the pressing member **413** may be cut out, such that the first link **42** is inserted into the pressing member **413**.

Meanwhile, the first link **42** is provided in the accommodation space **412a** to be movable in a vertical direction.

Specifically, the first link **42** includes a first slider **421** elongated in the vertical direction. The first slider **421** is formed in a rod shape and a second elastic member **422** is wound on an end thereof. The second elastic member **422** may be mounted in a recessed portion **411d** formed in the inner upper portion of the first cover **411**. That is, one end of the second elastic member **422** may be coupled to the end of the first slider **421** and the other end thereof may be coupled to the inside of the recessed portion **411d**, thereby elastically supporting the first slider **421**, such that the first slider **421** moves in the vertical direction.

Contact portions **423** for allowing the first slider **421** to move in the vertical direction is formed on the upper portion of the first slider **421**. The contact portions **423** may be formed on the first and second side surfaces of the first slider **421**. The contact portions **423** have a circular cross section, without being limited thereto, and may have a triangular or rectangular shape.

The contact portions **423** are placed on the upper side of the guide protrusions **413a** formed on the rear surface of the pressing member **413**. That is, the contact portions **423** may be located at certain points of the inclined surfaces **413b** of the guide protrusions **413a**. Accordingly, the contact portions **423** may move in the vertical direction along the inclined surfaces **413b** through line contact or surface contact with the inclined surfaces **413b**.

Stopper protrusions **424** for restricting upward and downward movement of the first slider **421** may be further formed at the lower sides of the contact portions **423**, that is, on the first and second side surfaces of the first slider **421**. Accordingly, when the first slider **421** is inserted into the slider slit **412c** to be mounted in the accommodation space **412a**, the stopper protrusions **424** may be accommodated in the stopper groove **412d**, thereby restricting upward and downward movement of the first slider **421**.

Hereinafter, coupling relationship among the pressing portion, the link portion and the latch hook of the opening unit will be described in greater detail with reference to FIG. 7.

FIG. 7 is a longitudinal cross-sectional view taken along line A-A of FIG. 2.

Referring to FIG. 7, the pressing portion **41** operated by the user is mounted in the mounting groove **332** formed in the outer surface of the refrigerating compartment door handle **33**.

The cover **32** of the pressing portion **41** is fixed to the inside of the refrigerating compartment door handle **33**, and the first link **42** is accommodated in the accommodation space **412a** formed by coupling the second cover **32** and the first cover **31**. In addition, the pressing member **413** is mounted to cover a portion of the first link **42** in the accommodation space. At this time, the first slider **421** of the first link **42** is fitted into the slider slit **412c** formed by coupling the first cover **31** and the second cover **32**, such that the first slider **421** is movable in the vertical direction.

In a state in which the first link **42** is fitted into the slider slit **412c**, the pressing member **413** is mounted to be in contact with the first link **42**.

Specifically, the pressing member **413** is mounted such that the first slider **421** is located between the pair of guide protrusions **413a**. The pressing member **413** is mounted in the accommodation space **412a** to be movable forward and backward (the left-and-right direction of FIG. 7)

At this time, the pair of contact portions **423** of the first link **42** are placed on the pair of guide protrusions **413a**. That is, the pair of contact portions **423** is in contact with the inclined surfaces **413b** of the pair of guide protrusions **413a**. Accordingly, when the pressing member **413** is pushed backward (the left direction of FIG. 7), the contact portions **423** may move upward along the inclined surfaces **413b** of the guide protrusions **413a**.

Meanwhile, the end of the first slide **421** is connected to the second link **43**.

Specifically, the second link **43** includes a second slider **431**. One end of the second slider **431** is connected to the first slider **421**. A link coupling portion **432** for coupling with the first slider **421** is formed on one end of the second slider **431**, and a link coupling groove **425** for coupling with the second slider **431** is formed in the end of the first slider **421**. Accordingly, the link coupling portion **432** is fitted into the link coupling groove **425**, thereby moving the first slider **421** and the second slider **431** as one body.

In addition, the other end of the second slider **431** is in contact with the latch hook **44**.

Specifically, the other end of the second slider **431** supports the bottom surface of the extension **441e** of the latch hook **44**. For example, when the first slider **421** moves upward by operation of the pressing portion **41**, the second slider **431** connected to the first slider **421** moves upward to move the latch hook **44** to be separated from the latch slot **312**. That is, when the second slider **431** presses the latch hook **44** upward, the latch hook **44** may rotate by the hinge portion **441c** in a clockwise direction to be separated from the latch slot **312**. At this time, the torsion spring **443** is pulled by rotation of the hinge portion **441c**, thereby generating restoring force.

Hereinafter, a method of operating the opening unit will be described in detail with reference to the drawing.

FIG. 8 is a view showing the state of the pressing portion and the latch hook when the pressing portion operates according to the embodiment of the present invention.

Referring to FIG. 8, the user may press the pressing member **413** of the pressing portion **41** in order to take out the food stored in the second storage compartment **106** in a state in which the first door **31** closes the first storage compartment **104**. Then, the pressing member **413** moves toward the cabinet **10** and, at this time, the first link **42** contacting the guide protrusions **413a** of the pressing member **413** moves upward along the inclined surfaces **413b** of the guide protrusions **413a**.

The second link **43** moves upward according to upward movement of the first link **42** and the upper end of the second link **43** presses the latch hook **44**. As a result, the hinge portion **441c** of the latch hook **44** rotates in a clockwise direction, and the hook portion **441a** may be separated from the latch slot **312**.

That is, when the user pulls the refrigerating compartment door handle **33** in a state of pressing the pressing member **413**, the second door **32** is opened such that the food stored in the second storage compartment **106** may be taken out.

The invention claimed is:

1. A refrigerator comprising:
 - a cabinet in which a first storage compartment is formed;
 - a first door rotatably connected to a front surface of the cabinet to selectively open or close the first storage compartment and including a latch slot formed in an edge of one side thereof;
 - a storage device formed on a rear surface of the first door to form a second storage compartment;
 - a second door rotatably connected to a front surface of the first door to selectively open or close the second storage compartment;
 - a door handle formed on a front surface of the second door; and
 - an opening unit configured to separate the second door from the first door when the second door rotates in order to open the second storage compartment, wherein the opening unit includes:
 - a latch hook provided on the second door to be selectively inserted into the latch slot;
 - a pressing portion provided on the door handle and including a guide protrusion having an inclined surface formed on one side thereof; and
 - a link portion having a contact portion formed on one end thereof to contact the inclined surface and to move upward and downward along the inclined surface, the other end of the link portion contacting the latch hook,
 - wherein, when the pressing portion is pressed, the contact portion moves upward along the inclined surface, and the other end of the link portion pushes the latch hook upward together with the contact portion, such that the latch hook is separated from the latch slot, and
 - wherein the link portion includes:
 - a first link accommodated in the door handle, the contact portion being located on the first link, and
 - a second link that is accommodated in the second door and that is configured to contact the latch hook.
2. The refrigerator according to claim 1, wherein the first link and the second link are coupled inside the second door.
3. The refrigerator according to claim 2, wherein the guide protrusion includes:
 - a first guide protrusion; and
 - a second guide protrusion formed at a point laterally spaced apart from the first guide protrusion, and
 wherein the first link is fitted between the first guide protrusion and the second guide protrusion.

4. The refrigerator according to claim 3, wherein the contact portion includes:
 - a first contact portion formed on a first side surface of the first link; and
 - a second contact portion formed on a second side surface of the first link, and
 wherein the first contact portion and the second contact portion are in contact with inclined surfaces of the first and second guide protrusions.
5. The refrigerator according to claim 1, wherein the latch hook includes:
 - a hook portion rotating about a hinge shaft; and
 - a hook guide guiding rotation of the hook portion, wherein the hook portion further includes:
 - a hinge portion;
 - a hook member bent at one end of the hinge portion and hooked on the latch slot; and
 - the hinge shaft formed in the other end of the hinge portion and serving as a rotation center of the hook portion,
 - wherein the other end of the link portion is in contact with a certain point of the hook portion spaced apart from the hinge shaft, and
 - wherein, when the link portion moves upward, the hook portion rotates about the hinge shaft such that the hook member is separable from the latch slot.
6. The refrigerator according to claim 1, wherein the pressing portion includes:
 - a pressing member having the guide protrusion protruding from a rear surface thereof and having a front surface pressed by a user;
 - a first cover having an opening formed therein to accommodate the pressing member; and
 - a second cover coupled to a rear surface of the first cover to surround one end of the link portion.
7. The refrigerator according to claim 6, wherein stopper grooves for restricting upward and downward movement of the link portion are formed in a rear surface of a lower end of the first cover and a front surface of a lower end of the second cover.
8. The refrigerator according to claim 6, wherein the door handle includes a mounting groove formed by cutting a portion of a front surface thereof, and
- wherein the pressing member is accommodated in the mounting groove, such that the front surface pressed by the user is exposed to an outside.

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